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Synthesis and application of barium ferrite/activated carbon composite as an effective solar photocatalyst for discoloration of organic dye contaminants in wastewater

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Highlights

- Barium ferrite/activated carbon composite synthesized and used as photocatalyst.
- In proper ratio, activated carbon increases photocatalytic reactivity of composite.
- Reaction parameters evaluated to achieve complete discoloration of organic dyes.

ABSTRACT

Barium ferrite and activated carbon were made into a composite to use as photocatalyst for discoloration of organic dyes. The synthetic composite and pure barium ferrite samples were characterized with different techniques. Adsorption studies revealed that the adsorption behavior follows the Langmuir adsorption model and adsorption is favorable in all studied concentrations. The effect of various parameters *viz.* catalyst synthetic temperature as well as catalyst loading, irradiation intensity and reusability on discoloration reaction was evaluated. More efficient composite was obtained when the synthetic temperature raised from 700 ^{0}C to 1000 ^{0}C.